

92

93. The fusion protein of claim <sup>62</sup>62, wherein the stress protein is hsp71.

93

94. The fusion protein of claim <sup>53</sup>54, wherein the stress protein is an Hsp100-200, an Hsp100, an Hsp90, Lon, an Hsp70, an Hsp60, TF55, an Hsp40, an FKBP, a cyclophilin, an Hsp20-30, C1pP, GrpE, Hsp10, ubiquitin, calnexin, or a protein disulfide isomerase.

94

95. The method of claim <sup>63</sup>64, wherein the immune response is a cell mediated immune response.

94

96. The method of claim <sup>94</sup>95, wherein the cell mediated immune response is a cell mediated cytolytic immune response.

94

97. The method of claim <sup>94</sup>95, wherein the cell mediated immune response is a class I-restricted T cell response.

94

98. The method of claim <sup>94</sup>95, wherein the cell mediated immune response is a class II-restricted T cell response.

98

99. A fusion protein comprising a human papillomavirus (HPV) antigen, or an antigenic portion thereof, and a stress protein or a portion thereof, wherein the fusion protein induces an immune response to the HPV antigen in a mammal to whom the fusion protein is administered.

98

100. The fusion protein of claim <sup>98</sup>99, wherein the HPV antigen is an E6 protein.

98

101. The fusion protein of claim <sup>98</sup>99, wherein the HPV antigen is an E7 protein.

98

102. The fusion protein of claim <sup>98</sup>99, wherein the HPV antigen includes a CTL epitope.

102

103. The fusion protein of claim <sup>102</sup>102, wherein the CTL epitope is a class I-restricted T cell epitope.

<sup>103</sup>  
104. The fusion protein of claim <sup>102</sup>, wherein the CTL epitope is a class II-restricted T cell epitope.

<sup>104</sup>  
105. The fusion protein of claim <sup>99</sup>, wherein the stress protein is a bacterial stress protein.

<sup>105</sup>  
106. The fusion protein of claim <sup>99</sup>, wherein the stress protein is an Hsp100-200, an Hsp100, an Hsp90, Lon, an Hsp70, an Hsp60, TF55, an Hsp40, an FKBP, a cyclophilin, an Hsp20-30, C1pP, GrpE, Hsp10, ubiquitin, calnexin, or a protein disulfide isomerase.

<sup>106</sup>  
107. The fusion protein of claim <sup>99</sup>, wherein the stress protein is a mycobacterial stress protein.

<sup>107</sup>  
108. The fusion protein of claim <sup>107</sup>, wherein the stress protein is hsp65.

<sup>108</sup>  
109. The fusion protein of claim <sup>107</sup>, wherein the stress protein is hsp71.

<sup>109</sup>  
110. The fusion protein of claim <sup>99</sup>, wherein the immune response is a cell mediated immune response.

<sup>110</sup>  
111. The fusion protein of claim <sup>110</sup>, wherein the cell mediated immune response is a cell mediated cytolytic immune response.

<sup>111</sup>  
112. The fusion protein of claim <sup>110</sup>, wherein the cell mediated immune response is a class-I restricted T cell response.

<sup>112</sup>  
113. The fusion protein of claim <sup>110</sup>, wherein the cell mediated immune response is a class II-restricted T cell response.

<sup>113</sup>114. A composition comprising the fusion protein of claim <sup>98</sup>99 and a pharmaceutically acceptable excipient, carrier, diluent, or vehicle.

<sup>114</sup>115. A method of preventing or treating an HPV infection in a mammal, the method comprising administering the fusion protein of claim <sup>118</sup>99 to the mammal in an amount effective to induce an immune response against the antigen.

<sup>115</sup>116. The method of claim <sup>114</sup>115, wherein the fusion protein is administered in combination with a pharmaceutically acceptable excipient, carrier, diluent, or vehicle.

<sup>116</sup>117. The method of claim <sup>115</sup>115, wherein the immune response is a cell mediated immune response.

<sup>117</sup>118. The method of claim <sup>116</sup>117, wherein the cell mediated immune response is a cell mediated cytolytic immune response.

<sup>118</sup>119. The method of claim <sup>117</sup>117, wherein the cell mediated immune response is a class I-restricted T cell response.

<sup>119</sup>120. The method of claim <sup>118</sup>117, wherein the cell mediated immune response is a class II-restricted T cell response.

<sup>120</sup>121. A method of preventing or treating an HPV infection in a mammal, the method comprising administering the fusion protein of claim <sup>97</sup>100 to the mammal in an amount effective to induce an immune response against the antigen.

<sup>121</sup>122. A method of preventing or treating an HPV infection in a mammal, the method comprising administering the fusion protein of claim <sup>97</sup>101 to the mammal in an amount effective to induce an immune response against the antigen.

Applicant : Lee A. Mizzen *et al.*  
Serial No. : 08/977,787  
Filed : November 25, 1997  
Page : 5

Attorney Docket No.: 12071-011002

<sup>122</sup>  
123. The fusion protein of claim 101, wherein the stress protein is mycobacterial Hsp65.

<sup>123</sup>  
124. A method of preventing or treating an HPV infection in a mammal, the method comprising administering the fusion protein of claim <sup>122</sup>123 to the mammal in an amount effective to induce an immune response against the antigen.--